

# Held Hostage by



By MMC(SW/DV) Kevin Gest, USN(Ret.)

While diving on USS *Monitor* in 1998 to recover its propeller, another diver and I found ourselves surrounded by 30 overly curious and overly large barracudas. They literally were in our faces, zipping behind and between us, then suddenly stopping inches from our faceplates, with one huge eye glaring in and their jaws jacking open and shut, as if tasting us.

We thought we were dinner, and it was a little late to consider enclosing our platform with a “Hooper cage.” It especially was nerve-wracking because we had more than 30 minutes of decompression due before surfacing. In the end, my partner chickened out; we got yanked from the water early and made up for omitted decompression in a recompression chamber.

I had flashbacks of that “hostage” event when I read the story about a lieutenant commander who was scuba diving with a group off a charter boat. The first dive went fine, and the second one did, too, until the group started ascending. A pod of whales congregated above them and drove them back down to 120 feet for eight minutes.

Once the whales left, the divers headed back up, making a couple safety stops along the way. The divers were using computers to track their dives, but it is unclear if the mishap victim knew how to use hers because she later would report she was unsure about her decompression stops during her ascent to the surface.

Twenty-six hours later, while aboard an airliner, she felt pain in her joints and took some anti-inflam-



matories, to no avail. Two days later, she still was in pain and walking with a decided list. A visit to a dive doctor revealed she had type II decompression sickness (DCS). The doctor hustled her into a recompression chamber.

While there is no way to account completely for loitering whales, planning for the unexpected should have prompted the diver to take along a written set of the decompression tables. Available on plastic, these tables would have allowed the diver to do a ballpark check on what her dive computer was telling her to do. They also would have provided a backup in case the battery in her computer died, or a shark ate it. Complete dependence on an electronic device to direct the flow of your dive in a wet environment is foolhardy (not necessarily a view supported by all diving commands).

Some divers copy parts of the dive tables onto a waterproof slate, taking into account possible variations to their planned dive. A second dive computer is another alternative. Costing \$300 to \$800, it's well worth the money if you dive frequently. However, if you're a frugal diver, and you still haven't found your first treasure ship, the wiser decision may be to rent a second dive computer.

Also, a better familiarization with the dive tables would have clued the diver into the fact that a 50-foot

decompression stop was quite unusual for her dive profile. The bottom time required for a 50-foot stop when diving to 120 feet is 180 minutes or more. Then, she would have had more than 280 minutes' worth of decompression due, divided into 10-foot increments, all the way to the surface.

The greater lesson here is learning what to do after an act of God occurs—one that you haven't planned for. You immediately need to assess the situation to minimize collateral damage and, after the dive, review the incident to prevent recurrence. If decompression was missed for this dive, someone should have caught it immediately afterward by comparing the depth and time of the dive with "standard air" decompression tables. Diving medical experts then should have been called in for their advice, even if there were no symptoms of DCS.

A review of this incident should question why decompression was missed. Did the dive computer work incorrectly? Did the diver know how to use the computer?

Here are some facts about commercially available dive computers (confirmed with a local dive shop that sells them):

- Dive computers track depth and time throughout your dive, with depth and time being inversely limiting factors. They register the deepest depth





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attained during a dive, but they also credit the diver for time spent at shallower depths during the “bottom time” phase. Regular dive tables consider all time during the “bottom time” phase as being spent at the deepest depth of the dive. This feature allows a diver using the dive computer to stay in the water longer than a diver using regular dive tables for a dive of equal “deepest depth” but lesser “average depth” (pushing the envelope).

- The computer tells whether you need to make decompression stops, indicating their depth and length of time.
- For dives of equal depth and time (without upward excursions), dive computers follow the “standard air” decompression tables fairly closely. The diver in this mishap would have been on this type of table.
- Most dive computers cannot account for body composition. Muscle and fat content, among a great many other factors, influence the speed of off-gassing inert gas (nitrogen) from the body’s tissues.

Several conflicts existed in this diving incident. The Navy “standard air” table for such a dive requires a stop at 20 feet for 15 minutes and another at 10 feet for 31 minutes; commercial tables closely follow this schedule. Five-minute stops at 50 and 30 feet were decidedly odd. The diver actually may have been on-gassing (taking on nitrogen) at her 50-foot stop, and, at the least, her off-gassing would have been negligible. If her dive computer was functioning normally, it should have told the divers when and where to stop

and for how long. It’s hard to tell, without knowing their variations in depth, but, for the divers to have missed more than 40 minutes of decompression in comparison to “standard air” tables, it appears the computer was broken, or the divers were.

Why didn’t the diver experience problems until 26 hours after the dive, while she was on a flight? Off-gassing continues in the body after surfacing from a dive until the inert gas (nitrogen) in all tissues equalizes with ambient air. The blood carries small molecules of nitrogen from tissues in the body to the lungs where it is expelled. If the nitrogen is off-gassed too rapidly at the tissue level, large bubbles will form and block the flow of blood.

Different tissues off-gas at different rates. Because of fatty tissue’s lack of vascularity, it off-gasses slowly and can act as a reservoir of inert gas in the body. This off-gassing will not cause a problem as long as the blood is able to carry the nitrogen to the lungs before bubbles form. A sudden decrease in ambient pressure, such as in an airline cabin, increases the speed of off-gassing. While decompression is considered complete after 12 hours, flying after this period, or even driving to a higher altitude, still may result in residual nitrogen being released from fatty tissues fast enough to cause bubbles to form in the body and block blood flow. ■

*The author was assigned to the Naval Safety Center when he wrote this story.*